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AIRPORT RIGHTS

Discrimination in the operation and use of airports has raised a number of questions concerning FAA's responsibility in these areas. Administrator N. E. Halaby has made the Agency's position clear.

Under the Federal Aviation Act, there can be no grant of exclusive rights for an aeronautical activity on any airport where Federal funds have been used. (Surplus property airports are an exception; legislation to bring them into line is now before Congress.) This policy was reaffirmed last summer when the Agency stated that the grant of an exclusive right to sell aviation gasoline and oil was clearly a violation of the law. Moreover, it was in conflict with the antimonopoly philosophy of the Administration.

An airport applying for Federal funds must agree to end exclusive agreements within a year from the date of the grant offer.

In practical application, three exceptions exist: Lack of land on which to locate another activity; safety hazard; insufficient volume of business. Economic data gathered to determine the volume of business will be treated as confidential.

The ruling also applies to recipients of previous grants who are not now applying for new grants. They are expected to comply by July 25, 1964.

An exception to the rule is that a municipality itself may exercise an exclusive right using its own employees.

FAA's position is far from requiring two operators at every airport. But its philosophy is clear: A free, open and equitable opportunity must be provided to those who would serve the consumer.

Also in need of clarification is the problem of civil rights. Here, FAA's position is based on the Constitution and the Federal Airport Act of 1946. Before approving a grant-in-aid project, the Act requires the Administrator to receive written assurances from the airport applying for the grant that "the airport . . . will be available for public use on fair and reasonable terms and without unjust discrimination."

Recent Supreme Court decisions have ruled that racial discrimination can have no place in such facilities of interstate commerce. In carrying out our responsibilities under the Constitution and the Federal laws, FAA will continue, as it has on several occasions, to request the Attorney General to take necessary action to assure the rights of all in airports and their facilities, regardless of race, color or creed.

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COVER: FAA recently issued pilots a multi-engine rating—center-line thrust—for these tandem-engine Cessna Skymasters.

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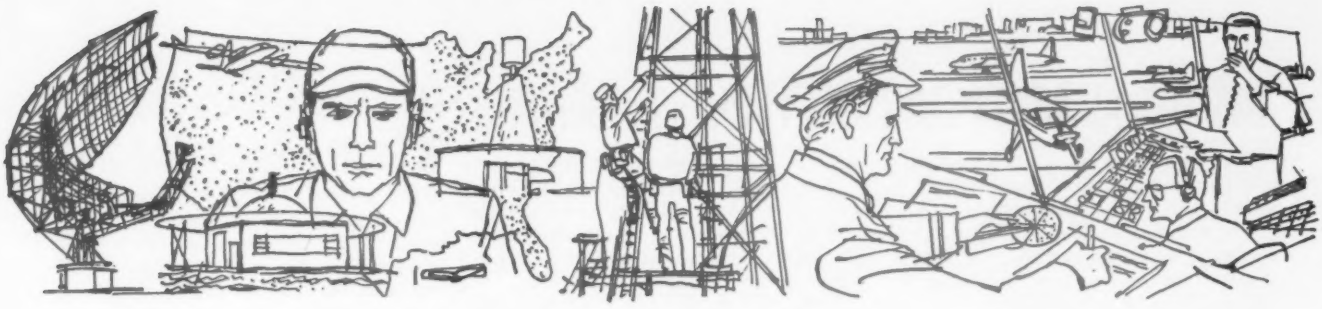


NEW SYSTEM FOR ISSUANCE OF AIRMEN CERTIFICATES PROPOSED BY FAA

FAA has set next January 1 as the tentative date for putting into effect its proposed new system for issuance of pilot, aviation mechanic and other airmen certificates.

The system was outlined last month in a Notice of Proposed Rule Making. It supersedes a proposal issued in March, 1962, and incorporates many suggestions solicited from industry by that notice. Comments on the proposed rule will be accepted until July 15 at the Dockets Section, Federal Aviation Agency, Washington 25, D. C.

Basically, the proposed system calls for the following:

- Issuance of a consolidated certificate card listing all the airman ratings and privileges due the holder. Medical certificates also would be shown on the card. The card would be wallet size and made of durable material.
- Submission of information every two years by airmen reflecting the extent of their active participation in aviation.
- Issuance of a new card every two years to airmen providing this information.
- A prohibition against exercising the privileges of a certificate if the holder has not applied for his new card on time. The prohibition would last until the application was filed.

Original Proposal Modified

In addition, FAA would adopt a uniform 24-month cycle for certificate revalidation in place of the 6 to 24-month variable cycle originally proposed. It also would use the certificate holder's birth month as the specified time for revalidation, in place of tying it to the time of medical examination or date of issue as proposed originally.

Furthermore, the Agency would eliminate certain aspects of the original Notice of Proposed Rule Making which drew sharp industry comment. These include expiration of certificates that are not revalidated or renewed in time; requiring the certificate holder to be re-examined for reissuance of certificates which are not revalidated or renewed in time; requiring appropriate medical qualification as a condition to certificate revalidation and renewal; and requiring prescribed recent experience as a condition to certificate renewal.

FAA, however, will continue to require airmen to meet the present requirements regarding medical qualification and recent experience in order to exercise the privileges of their certificates.

Application Forms Available

Initial revalidation for certificates issued after the proposed effective date (January 1, 1964) would be required before the end of the holder's birth month in 1964 if he was born in an even year, or in 1965 if he was born in an odd year. All certificates issued or revalidated after the effective date would be in the new form and show the date when the next revalidation is due.

A certificate would be revalidated simply by filling out and submitting an application form. During the two-year period for initial revalidation, it would be up to each airman to obtain and file his application. These forms would be available from any FAA regional or district office as well as the Washington headquarters. Once a certificate had been revalidated, the Agency would mail an application to each holder prior to expiration.

Limited Duration Certificates

Certificates which presently have a limited duration—such as student and special purpose pilot certificates—would continue to have a limited duration and would not be subject to revalidation. However, in those cases where the present duration is less than 24 months, it would increase to 24 months.

Upon request, aviation pioneers holding airman certificates numbered 5000 or below will be permitted to retain their present number on their revalidated certificates. The identifying number on all other certificates will be the holder's social security number or a number issued by FAA if he has no social security number.

FAA said the changes incorporated in the new proposed rule would not affect the two main objectives of its revalidation program.

These objectives are modernization of the Agency's certificate issuance system and the acquisition of data considered necessary for the proper discharge of the Agency's responsibilities.

For example, information secured through the revalidation process would permit FAA to evaluate the effectiveness of existing regulations and identify areas where new rules are needed or present rules are unnecessary. It also would permit the Agency to compile an up-to-date mailing list for the dissemination of safety information.

Present System Obsolete

The present system of issuing airman certificates has remained virtually unchanged from the earliest days of the old Civil Aeronautics Administration and no longer serves the needs of the public, the aviation community or the Agency.

Airmen certificates presently are issued for an indefinite period. Although there are requirements for medical examinations and for maintaining proficiency, there is no present means of keeping the central record system up-to-date. Approximately 1,800,000 airman certificates have been issued since 1926. All of them remain in the file.

Files Modernized

After the proposed new system goes into effect, all records relating to certificate holders would be kept in a current file for the first four years.

Thereafter, records relating to certificates not revalidated by airmen within two years after the time specified for their revalidation would be removed from the current file and stored separately.

AMENDED AIRPORT PLAN CALLS FOR 3,559 AIRPORTS

FAA has amended the National Airport Plan covering fiscal years 1963-67 to include 171 additional airports.

The updated plan lists 3,559 individual airports which must be built or improved if civil aviation is to achieve its full potential. The total includes 2,495 fields for general aviation exclusively and 1,064 for both general aviation and the airlines.

Although no funds are provided for in the plan, it estimates the total cost of the recommended projects over the five-year period at $1,082,439,000. This amount covers Federal, state and local expenditures.

The 1963 edition of the National Airport Plan supplements the one published last year and contains only those facilities having substantial changes in planning data. Also listed are airports added to or deleted from the plan. The 1962 and 1963 editions must be used together to get a complete listing of fiscal year 1963-67 airport needs.

Major purpose of the plan is to provide information on airport projects which may be considered for a grant under the Federal Aid Airport Program. It is revised and submitted to the Congress annually as provided in the Federal Airport Act of 1946.

Inclusion of an airport in the plan makes it eligible for Federal funds but does not assure it of receiving aid. No airport can be considered for government aid if it is not listed in the plan.

A total of $75 million already has been appropriated by the Congress for the Federal Aid Airport Program for fiscal 1964. Grants to individual airports will be announced this summer.

Seven million of the $75 million is earmarked exclusively for general aviation airports. The remainder may be awarded to fields serving general aviation only or those serving both general aviation and the airlines.

In submitting the 1963 edition of the plan to Congress, FAA Administrator N. E. Halaby stated:

"The improvements needed in our Nation's airport system must be recognized and dealt with, if aviation is to proceed unhampered on its natural course of dynamic growth. Aviation's profoundly beneficial influence on the Nation's economy has been amply demonstrated and deserves substantial encouragement.

"It is not only at airline stops where inadequacies must be remedied; the aviation community must focus attention on the increasing needs of that rapidly growing segment of its economy, general aviation."

Copies of the 1963 National Airport Plan are on sale for 60 cents from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Copies of the 1962 edition also are available for $2.25.

St. Petersburg-Clearwater (Fla.) International Airport was scene of the first hangar flying session held in 1963, marking the beginning of the third year of informal give-and-take talks between Administrator N. E. Halaby and airmen. Next hangar flying session is set for Greater Rockford (Ill.) Airport August 3.

FAA Issues Preliminary Report On Survey of Aviation Mechanics

The number of active certificated aviation mechanics in the United States is estimated by FAA at approximately 80,000. The total includes 44,000 working in general aviation, 30,000 with the airlines, and 6,000 with manufacturers or in government.

This estimate is based on preliminary data obtained from FAA's 1962 Survey of Maintenance Airmen and other statistical information available to the Agency.

Survey questionnaires were distributed to all segments of aviation—the airlines, corporate aircraft owners, repair stations, fixed base operators, mechanic schools, manufacturers and military services—and drew 28,626 replies. All but 338 were usable for statistical purposes.

The airlines provided the largest response with 16,714 completed questionnaires. Only 11,574 usable replies were received from general aviation, however. This relatively slim response by general aviation is attributed to the wide deployment of aviation mechanics in this field.

Approximately 48 percent of those responding were younger than 40. Fifty percent were between 40 and 60, and two percent were 60 or older. Only 14 percent were in their twenties; 27 replies were received from aviation mechanics under 20.

Only 13,711 respondents, or 48 percent, reported having received any work-related training during the 24-month period of 1961-1962. Similarly, only 40 percent received any kind of on-the-job training during the same period, and a mere seven percent received any training at a manufacturer's service school.

As might be expected, the largest concentrations of certificated aviation mechanics are found in the most populous states. California led all states in responding to the survey with 5,735 replies. It was followed by New York with 3,321, Florida with 2,347, Texas with 1,541, Oklahoma with 1,327, Missouri with 1,073, Minnesota with 1,063, Illinois with 938, New Jersey with 928, and Pennsylvania with 796.

Until now, little information has been available on the number of active certificate holders, industry utilization of these airmen, the types of equipment on which they work, or their activities and duties. The survey was conducted to develop this data.

Additional information from the survey will be released as it becomes available after further analysis by FAA.

AWARDS ESTABLISHED TO RECOGNIZE OUTSTANDING AVIATION MECHANICS

A national system of awards recognizing outstanding aviation mechanics has been established by the Federal Aviation Agency. Known as the Aviation Mechanics Safety Awards, they are part of an FAA program proclaimed recently by Administrator Halaby to observe 1963 as Maintenance Year.

Annual awards will be presented to aviation mechanics making outstanding individual contributions to air safety. Purpose of the awards is to foster mechanics' pride and skill in their work and to increase the incentive to improve. It also is felt that the awards will help obtain increased recognition for aviation mechanics.

Grand national awards, which follow preliminary awards, will be administered by the Flight Safety Foundation, an organization devoted solely to safety in flight. Industry and aviation trade organizations also are cooperating.

In conjunction with the Flight Safety Foundation, the FAA has designated the following standards for selecting winners: (1) for the suggestion of a re-design or fix to an aircraft or any of its components that led to or resulted in increased reliability and/or safety; and (2) for the suggestion or development of a maintenance and/or inspection procedure that contributed significantly to aviation safety.

Two aviation mechanics will be chosen national winners in each of two major categories. One of the aviation mechanics will be from an air carrier, while the other will represent general aviation. The two national winners will be selected by the Flight Safety Foundation and FAA from a total of fourteen regional winners, two from each of the FAA's seven regions. Awards also will be presented in each state to winners in both categories.

All winners will receive appropriate citations. Certificated mechanics also will receive metal reproductions of their FAA mechanic certificates. Trophies will be presented to state and regional winners. The two national winners, chosen from the fourteen regional winners, will visit Washington for a formal presentation of a special plaque.

Nominee forms will be available at all airports, maintenance stations, and aviation facilities and from FAA inspection personnel. Any qualified person having intimate knowledge of an aviation mechanic's accomplishment may submit a nomination. It is desirable, however, that nominations be submitted by appropriate supervisors. Nominations for this year's awards will be open starting June 1 and will continue until September 1, 1963.

Initial screening of nominations at the state level will be made by a committee of leading maintenance personnel. These will include state aviation officials and experts from aircraft maintenance and overhaul firms. Final screening in the regions will be done by FAA personnel and representatives of industry. The two national winners will be chosen by the Foundation and FAA together with a committee of prominent aviation figures.

Noted Pioneer Aviatrix Honored by Issuance of Commemorative Airmail Stamp

"KHAQQ calling. We are on line of position 157:33. We are . . . run . . . ning . . . north . . . and . . . south."

Then silence, silence since 8:44 a.m., July 2, 1937.

KHAQQ—Amelia Earhart—was calling the Coast Guard cutter *Itasca* lying off Howland Island in the mid-Pacific, her last refueling stop on the final leg of a round-the-world flight. Because of a difference in radio frequencies, the *Itasca* was unable to establish contact and give her bearings.

Amelia Earhart had told reporters shortly before her flight: "Don't worry about me. I know the risks involved. I'm willing to take them. If I make it, I will have the satisfaction of knowing that I have added an important new chapter to aviation. If I go down—well, it will have been worth it. I've had a very wonderful life."

On July 24, in Atchison, Kansas, where the pioneer aviatrix was born 65 years ago, an Amelia Earhart commemorative postage stamp (*right*) goes on sale. Six charter members of the 99's—the women's air organization founded by Amelia Earhart—will fly first-day cachet envelopes to the four corners of the United States. Blanche Noyes, FAA air-marking specialist and close personal friend of Amelia Earhart, will fly from Atchison, Kansas, to Washington, D. C., to present the President and other dignitaries with their cachet envelopes.

Amelia Earhart's achievements:

- First woman to fly alone across the Atlantic (13 hours, 30 minutes—a trans-atlantic record) May 1932.
- First woman to fly from Hawaii to Oakland—January 1935.
- Goodwill flight from Burbank to Mexico City—May 1935.
- Non-stop flight from Mexico City to New York City—May 1935.
- Round-the-world-flight: Miami, Puerto Rico, South America, Africa, India, Java, Australia, New Guinea, and, somewhere near Howland Island in mid-Pacific . . . March, 1937-July 2, 1937.

Last month, Betty Verret Miller, a former communicator in a Flight Service Station, flew solo from California to Brisbane, Australia, following Amelia Earhart's trans-Pacific flight in reverse—in memory of KHAQQ.

Seminar Program Keeps Aviation Medical Examiners Up to Date

Nearly half of FAA's aviation medical examiners have attended three-day medical seminars designed to keep them abreast of the latest research in aviation medicine and to familiarize them with FAA's examiner program.

Since December, 1960, when the program began, 42 seminars have been held at universities around the country. By December, 1964, FAA hopes to have a total of 6,000 aviation medical examiners complete the seminars.

FAA plans an advanced seminar program this September for the nearly 2,700 who have completed the basic course.

FAA PEACE OFFICERS RIDE SHOTGUN ON AIRLINES TO FOIL SKYJACKERS

Left, Attorney General Robert Kennedy chats with FAA peace officers after swearing-in ceremony. Right, pistol target practice at Border Patrol Academy.

A hand-picked corps of FAA peace officers, organized last year to help prevent aircraft hijackings, has completed a one-week refresher course in law enforcement techniques and procedures at the United States Border Patrol Academy in Port Isabel, Texas.

All of the men are graduates of a specialized training course given at the Border Patrol Academy in February and March of 1962. They subsequently were sworn in as Special U. S. Deputy Marshals by Attorney General Robert F. Kennedy.

FAA Administrator N. E. Halaby pointed out the value of recurrent training in maintaining peace officer proficiency in the techniques of armed and unarmed defense. He said the Agency plans to have the refresher course repeated annually.

Halaby initiated the peace officer program to assist the Federal Bureau of Investigation in enforcing the Federal statute covering air piracy and other crimes committed abroad aircraft. The statute was enacted by Congress following a wave of skyjackings in the spring and summer of 1961. It was signed by President Kennedy September 5, 1961.

The marshals will be assigned to ride airline flights on request from company management or the FBI. They will wear civilian clothes and may travel in any section of the plane they are assigned to.

In a skyjacking attempt, the officers have been trained to disarm the skyjackers or take other appropriate action consistent with the safety of passengers and crew. Although armed, they will avoid use of firearms if at all possible.

All of the marshals are employed by FAA's Flight Standards Service as aviation safety inspectors. They will continue in their regular jobs except when on special assignment as peace officers.

Those currently available for duty were selected early in 1962. Each was carefully screened and tested to assure that he was both physically capable of performing peace officer duties and sufficiently stable emotionally to be dependable under considerable stress.

All but one are veterans of the armed forces. Several have served as many as 20 years in the military as commissioned officers before joining FAA. Their average age is 40, and all are married.

During the initial and refresher training course at the Border Patrol Academy, the men received an intense indoctrination in the duties, responsibilities and authority of FAA peace officers. They also were taught basic law enforcement concepts and practices pertaining to arrests.

Training was given in the use of firearms, including the .22 and .38 caliber pistol and pen-type tear gas gun. In addition, they were schooled in judo and other techniques for subduing violent persons without using firearms.

A review of previous skyjacking incidents was included in the initial training program. The officers were briefed by Leonard W. Gilman, an official of the Immigration and Naturalization Service, who helped to disarm and capture the hijackers of a Continental Airlines jet at El Paso, Texas, in August 1961.

Joint CAB-FAA National Aircraft Accident Investigation School Established

A special school to teach the techniques of aircraft accident investigation has been established at the FAA Aeronautical Center in Oklahoma City.

Called the National Aircraft Accident Investigation School, it will be a joint Civil Aeronautics Board-FAA effort. Marion Roscoe, an air safety expert who has worked for both CAB and FAA, has been appointed dean of the school.

The school will offer a six-week course in current aircraft accident investigation practices. Classes will begin in September with each class consisting of 20 selected students.

Initially, the school will be limited to CAB and FAA personnel. Later classes will include selected individuals from the aviation industry who regularly participate in aircraft accident investigations and air safety representatives of foreign governments.

The Federal Aviation Act of 1958 provides for both CAB and FAA participation in the investigation of civil aircraft accidents but gives CAB sole responsibility for determining probable cause. Non-fatal general aviation accidents involving aircraft weighing less than 12,500 pounds are investigated by FAA under an agreement with CAB.

Policies for the new school will be established and monitored by a committee of trustees. The group includes Mr. Roscoe; Dr. George L. Cross, President of the University of Oklahoma; Carl Schmidt, engineering director for the Flight Safety Foundation; Bobbie R. Allen, deputy director of CAB's Bureau of Safety; Warren J. Vibbard, executive assistant, CAB Bureau of Safety; George S. Moore, Director of FAA's Flight Standards Service; and O. C. Lott, chief of the training division in FAA's Office of Personnel and Training.

SAGA OF A RESURRECTED "TIN GOOSE" SPANS MORE THAN THREE DECADES

Right, FAA Inspector checks pilot in ancient Ford.

Ford tri-motor which will be donated to Smithsonian Institution and exhibited in the new Air Museum.

Some airplanes, like old soldiers, never die; and in the case of the Ford tri-motor, they don't even fade away very fast.

Out of production since 1929, the Tin Goose is still on active aerial duty. Last month, Merle Hunter, FAA Air Carrier Supervising Inspector at Fort Worth, had the unusual experience of checking out a Ford tri-motor crew at Tulsa for American Airlines.

The corrugated workhorse of another generation is one of 10 on active status according to FAA registration records. In addition, an uncounted number still operate in far corners of the world.

American Airline's Tin Goose, NC-9683, has just as fascinating a history as her other silvery sisters still flying. This is the second time American has owned NC-9683 and following a recent face-lifting, she gleams just as brightly as that day in the '20s when she first rolled off the production line.

NC-9683 was first sold by Ford to a southwestern oilman in 1929. The following year American Airways, predecessor of American Airlines, bought the Tin Goose. During the depression she was stored but returned to active duty as a backup plane for the airline at Cleveland.

In 1936 she went to work for a Central American airline, then was sold to a Mexican company and then on to Montana for crop dusting. After a cargo-hauling stint in Alaska, the Ford was re-sold to a firm in Mexico and for a time had the undignified but functional task of serving as a home—complete with pot-bellied stove and chimney—for a family living on an air strip at Guadalajara. The airplane returned home to American and her final moment of glory—a promotional tour this summer.

But after NC-9683 makes her last landing, she's not headed for the scrap heap. NC-9683 will be given to the Smithsonian Institution and installed in a place of honor—beside the *Spirit of St. Louis* and the *Winnie Mae*.

Agency Withdraws Two Previously Proposed Rules

FAA has withdrawn a proposed rule which would have required installation of flight data recorders on certain high-performance general aviation aircraft to record altitude, airspeed, heading, vertical acceleration and elapsed time.

The rule would have applied to all large turbine-powered aircraft (those with a maximum certificated takeoff weight of more than 12,500 pounds) and all other large aircraft certificated for operations above 25,000 feet.

In withdrawing the rule, FAA cited the remote potential for obtaining useful accident prevention information. Only one accident in the past 24 months involved an aircraft covered by the proposed rule.

Also cited were (1) the high cost of installing and maintaining the equipment, (2) the extensive ground time needed for repairs, and (3) the fact that the few aircraft covered by the proposal—approximately 180—involved a wide variety of types and configurations, thereby reducing the applicability of acquired data.

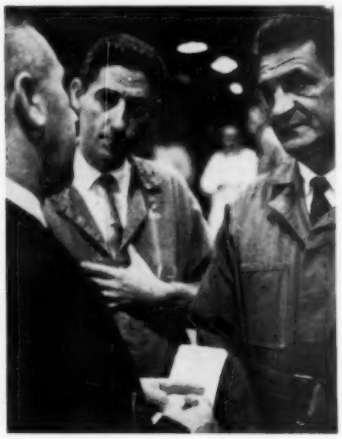
FAA presently requires flight recorders on all large turbine-powered airline aircraft and all other large airline aircraft certificated for operations above 25,000 feet.

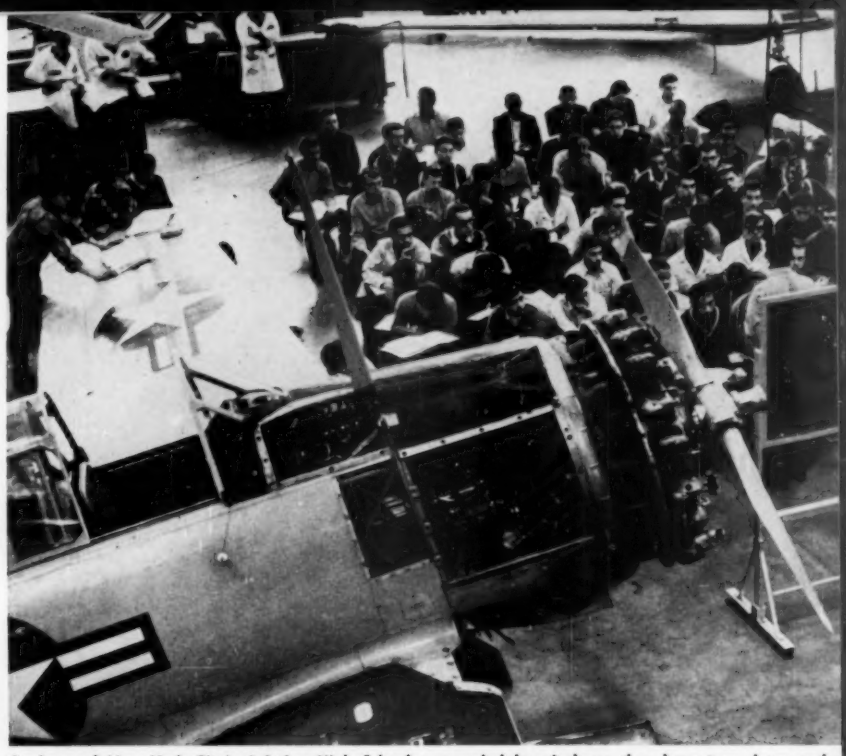
The Agency also has withdrawn a proposed rule which would have provided for the maintenance of large non-air carrier aircraft by air carriers.

The proposed amendment to Parts 18 and 43 of the *Civil Air Regulations* would have authorized carriers to perform maintenance on large piston and turbine aircraft belonging to non-air carrier operators. They would not have been required to obtain a repair station certificate for the type aircraft involved.

The notice of withdrawal of the proposed rule making states that need for the regulation has not been clearly demonstrated. However, when a situation arises where it is requested that a particular aircraft be maintained by an air carrier, the case will be handled on its own merits, by exemption if appropriate.

Above, budding aviation mechanics catch up on paper work in school hangar. Below, FAA's General Aviation Maintenance Inspector Dan Radice with shop instructors.





Students of New York City's Aviation High School surrounded by airplanes they have torn down and r

THE CLASSR

The next generation of aviation mechanics is being trained in places such as New York City's unique Aviation High School, the only public school in the nation devoted entirely to developing the vital maintenance skills that keep airplanes flying safely.

This remarkable institution, now 25 years old, operates in a five-year old, $8.5 million modern structure housing $2.5 million worth of equipment in its block-square building. Each year the 130-man faculty, under veteran aviation educator Principal Frank Woehr (rhymes with gear), turns out about 460 graduates from its student body of 2,200.

Everything about the school—teachers, students, curriculum, facilities—is special:

■ About 55 percent of the faculty teaches traditional academic subjects—English, mathematics, history and economics, which account for half the school day. The remainder of the teaching staff, 80 percent of whom have their A&P licenses, have at least seven years experience in aviation mechanics. One instructor, Tom Cassesse, is an alumnus of the school who studied under Frank Woehr when the latter, an airframes instructor, was a member of the original faculty in 1936. Cassesse retired after 20 years as an Air Force mechanic and returned to his alma mater to teach.

■ Students are handpicked. Only a third of the 2,500 applicants each year can be admitted. They must pass a qualifying entrance examination and undergo a personal interview to determine their interest and general attitude toward aviation mechanic training. "We aim," says Principal Woehr, "at air-minded boys who've been interested in airplanes since they were knee-high to a tail wheel." As a result of this screening, enthusiasm is high, disciplinary problems low.

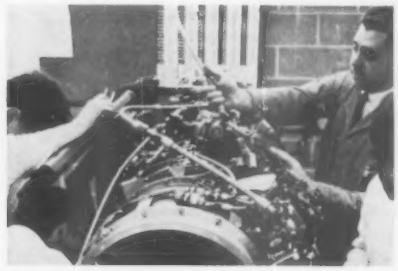
■ Because the four-year curriculum is divided between the humanities as well as shop work and technical subjects, graduates have two routes open to them: preparation for college, or training that will qualify them for a job as an apprentice aviation mechanic. After the first year in the high school, a unique "exploratory" program weeds out those unsuited to pursue technical training.

A survey taken four months after graduation shows this typical picture: More than 29 percent of the entering students

ntless times.

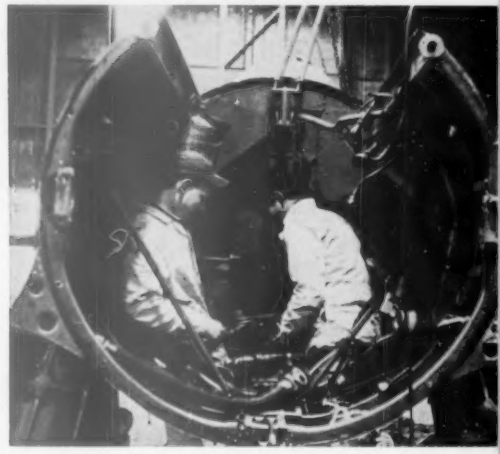
Learning by doing in well-equipped shop.

Electrical theory precedes actual shop practice.



Above, working on jet engine under instructor Tom Cassesse. Below, a Stearman rebuilt by students.

Replacing hydraulic lines on surplus military plane donated to school by Air Force.



OM IS A HANGAR

go on to higher education after graduating from Aviation High, mainly to colleges of engineering. West Point, Annapolis and the Air Force Academy also claim a handful. Another 27 percent get trade-related jobs with nearly 10 percent going into other job fields. The 10 percent taken by the military draft find they have a headstart in the armed forces and advance more quickly because of their technical training.

Since Aviation High is one of 68 FAA-approved A&P mechanic schools, qualified students can get their FAA license along with their high school diploma. More than 8,000 alumnae are in aviation jobs today, some of them as airline pilots or in top maintenance positions.

The school occupies an entire block and comprises five building units. There are two main structures, each seven stories high. One contains the academic, technical and administrative section with five science laboratories and demonstration rooms, four mechanical drawing and arts rooms, library, offices, medical suite, cafeteria and 22 standard classrooms. The other building houses 32 aviation mechanic shops.

Shop activities are related to composite airframe construction, basic and advanced powerplant overhaul and maintenance, sheet metalwork, hydraulics, accessories (carburetors, magnetos), electricity, machine shopwork, propeller repair and welding.

Next to the shop building is a 15,000-square foot maintenance hangar that opens on a 15,000-square foot concrete apron. It is equipped with fuel units and aircraft tie-downs to afford outdoor experience for students in engine operation and aircraft handling.

Adjoining the hangar is a six-unit engine-testing cell whose acoustical construction reduces noise below street level sounds. In the test cells, students can run up six piston engines or two 1,000-lb thrust jet powerplants.

"It's a real thrill," said one youth, "to hear a live engine after three or four years of tearing one apart and putting it back together."

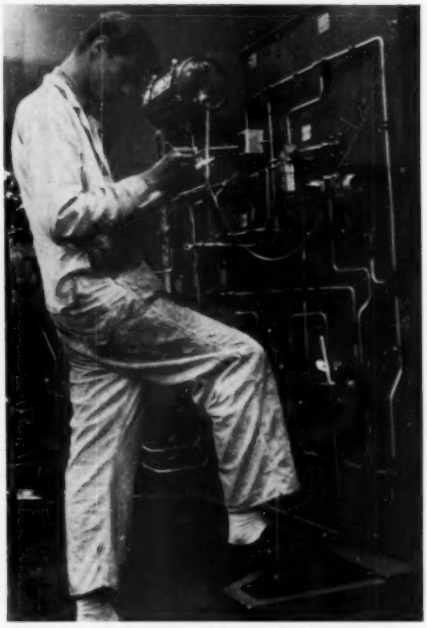
Keeping a watchful eye over Aviation High is FAA's General Aviation Maintenance Inspector Dan Radice. Periodically, Radice visits the school to check the equipment, facilities and curriculum. In informal chats, Radice brings the teachers up-

Bell signalling end of school day fails to interrupt hangar flying session between students and instructor.

to-date on the latest regulations and developments in the maintenance field. He devotes more time to the school's four designated mechanic examiners who give the students the FAA practical examinations. The results are spot-checked by FAA.

The dedication and pride that permeates Aviation High School is summed up by a school spokesman:

"It is the mission of our school to give our city and the country our share of the trained manpower necessary to control the present and influence the future. The most important element in technical manpower is trained young men who have developed a dedication under the instruction of experienced teachers—boys who have a feeling as to what is right and worthy and best, and are trained to do their best. . . ."



Student carefully notes reading at hydraulics mockup.

A quick wash, out of coveralls, and just enough time to make the next class—math.

Gymnasium provides youths with full physical education program. School competes in all intermural sports except football.

SAFETY FIRST

Night Flying

Shadows and darkness may be deceptive, but night flying can be easier if a pilot takes time to learn something about night vision.

No matter how good you are at day VFR or simulated instrument flying, good night vision can be the difference between a safe flight and an unsuccessful one. Night vision must be understood and practiced before proficiency can be achieved.

What you see when you look at something in the dark depends how well your eyes have adapted to the darkness—and this takes time. If you have ever entered a darkened theater from the bright outdoors, you've experienced this as you groped blindly for a seat. After six or seven minutes your eyes become a hundred times more sensitive. Vision continues to improve but it takes 30 minutes for the eyes to become fully adjusted to the darkness. The problem of adjusting works in reverse too, but it takes less time.

However, the inability of the eyes to adjust rapidly to extreme brightness is more serious at night than in the daytime. When the eyes are fully adapted to darkness, a brief, strong light can impair vision for several minutes. If you look at the light for a longer period of time, it may take half an hour before the eyes return to peak efficiency.

Although red-lighted cockpit instruments help night vision, conventional white light is also effective and simulates daylight instrument presentation if the light intensity is properly controlled. Use just enough light to be able to read the instruments, but keep glare at a minimum. When flying over a brightly lighted city or in an area of severe lightning, brighter cockpit lighting is necessary.

To help conserve night vision a pilot should know the location of switches, buttons and controls so that they may be operated without lights if necessary. A flashlight should be available, but avoid flashing either direct or reflected rays into the eyes.

The art of seeing at night involves more than merely adapting the eyes to night vision, and then looking in the general direction of what you want to see. Ordinarily, when something catches your attention out of the corner of your eye, the eyes turn toward the object to get a better look. This is correct for day viewing when the point of sharpest vision is at the center of the eye. At night, however, vision is reduced at the center. *Always look slightly away from the object you wish to see.* Frequently, the eyes move irresistibly toward the object. When this happens, swing the eyes beyond the object so that it can be picked up again at the other side of the eyes.

If, for example, you see another aircraft in the distance and then lose it, don't try to bore through the darkness to find it again. Move your eyes in a circle around the area of the other plane, focusing always slightly away from it. The object will be sighted again by looking to either one side, over, or under it. It takes practice, but it works.

Learn to move the eyes frequently in dim light. As you search, don't sweep the sky at random; scan by searching a small area carefully, then jumping the eyes to the next area. Blink if an image becomes blurred. Periodic rests improve scanning. This type of viewing admittedly is not natural and will have to be practiced until it becomes automatic—but it pays off.

Night Flying Safety Precautions

Takeoff:

- Avoid bright lights. The glare of brightly lighted terminal buildings, floodlighted aircraft under repair, and other areas of high intensity lighting can impair night vision during the crucial takeoff phase.
- Use a definite reference, such as boundary lights or even a star, to maintain directional control.
- Keep one eye on the instruments and have a ground reference point immediately after takeoff. This will help prevent disorientation caused by the sudden darkness encountered as you become airborne.

Enroute:

- Don't attempt violent or abrupt maneuvers, and keep one eye on the instruments. At night, with fewer ground references, altitude and speed are deceptive.
- Watch for disappearance of ground lights or look for an area of red or green glow around wing position lights. You may be entering instrument weather conditions.
- Fly as high as possible to see maximum ground area. The farther you can see, the better your navigation will be.

Landing:

- Be sure you know field elevation and current altimeter setting to insure proper height of your traffic pattern. Common ground objects, by which you judge in daylight, obviously are not as easily seen at night.
- Remember the deceptiveness of altitude and speed at night. A normal approach looks steeper at night, creating an illusion of overshooting which may actually result in undershooting. Keep one eye on the instruments.
- Make power approaches for better control of rate of descent, and don't be hypnotized by the landing lights. Maintain approach angle by using the runway lights. Landing light beams have a psychological attraction that may fly you right into the ground.
- Maintain close control of approach speed. This is more difficult at night because of lack of clearly defined ground reference pointts. Check airspeed indicator and altimeter frequently.

DANGER

This is the third in a series of articles prepared by meteorologists of the U. S. Weather Bureau.

Scientists estimate that 44,000 thunderstorms lash the earth's surface every day. At any given moment, 1,800 of them are in action, spelling potential trouble for aircraft and pilots.

Thunderstorms come in many sizes and shapes but all carry a danger tag. Most pilots have been confronted with thunderstorm conditions at one time or another in their flying careers, but fortunately, not many have actually flown into a thunderstorm and out again. Those who have, however, present the most dramatic arguments for staying out of them.

Often called weather factories because of the great variety of weather they produce, thunderstorms commonly bring extreme fluctuations in ceiling and visibility, wind direction and speed, intensity of precipitation, and temperature. When thunderstorms form on a summer afternoon, the temperature is usually above 85 degrees, often in the 90's. The wind and rain produced by the storm may quickly send the temperature as low as 65 degrees in the surrounding area.

For aviators, thunderstorms can mean extreme turbulence as well as sustained updrafts and downdrafts. For aviators—and farmers—thunderstorms can mean damaging hail, lightning strikes, and electrical interference that snarls radio signals. Summed up, thunderstorms are meteorological monsters and a fundamental flying rule is to stay out of them.

Such storms may occur in this country at any time of the year, but in general they are rare in cold weather. They occur most frequently during the warmer hours of the warmer months and, geographically, most frequently in the southeastern United States. However, frequency of occurrence has nothing to do with intensity. No thunderstorm is ever described by the Weather Bureau as "light" in intensity, and any thunderstorm merits respect from pilots.

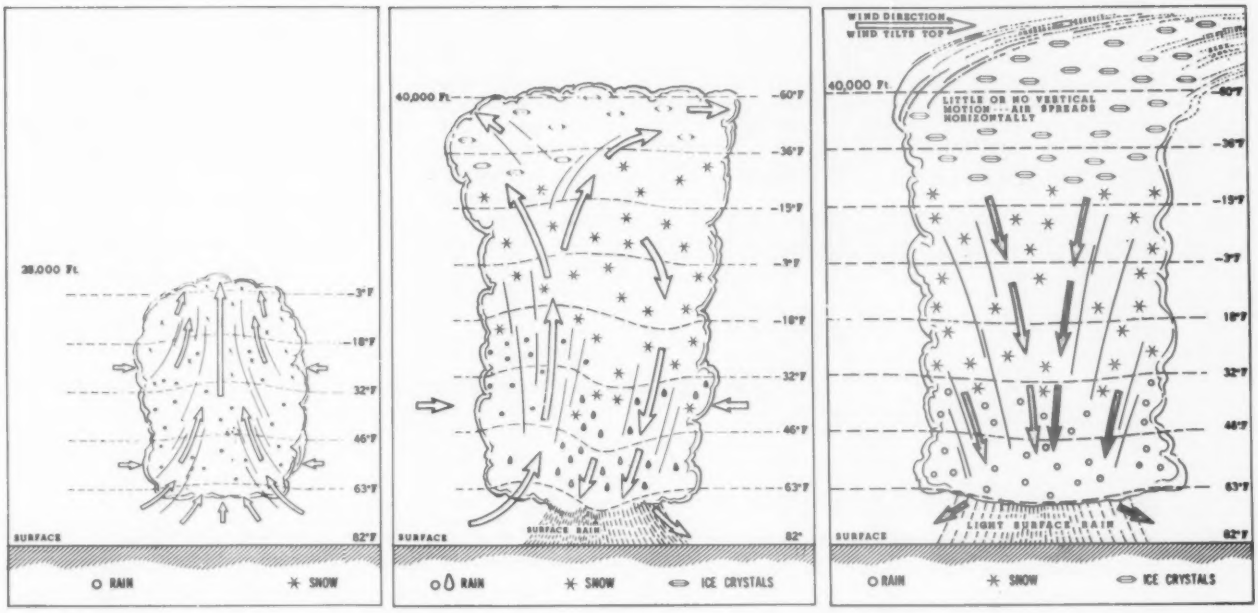
A thunderstorm is a shower cloud, or a collection of shower clouds, producing electrical discharges that are seen as lightning and heard as thunder by an observer on the ground. Thunderstorms occur individually as separate, widely-spaced storms, or in long lines roughly parallel to a front, ordinarily a cold front.

Although every thunderstorm begins as a cumulus cloud, only a few cumulus clouds actually become thunderstorms. This occurs when moisture-laden air is driven aloft, then cools by expansion in the lower pressures. Moisture in the air condenses. Condensation, in turn, releases heat and the air continues to rise and expand farther into the surrounding cooler upper atmosphere. An unstable chain reaction is in this way set up. The air may be driven aloft originally by the sun's heating the earth's surface beneath it or by being forced to climb the side of a mountain or frontal slope.

When a cumulus cloud begins to lose its clear-cut outlines on top and takes on a fuzzy appearance, it becomes a cumulonimbus cloud or a thunderstorm.

Each thunderstorm is a family of convective cells in different stages of development and with individual circulation

THUNDERSTORM AHEAD



Idealized cross-section of thunderstorm cells as they develop. Shown left to right are: Cells in the cumulus stage, in the mature stage and in dissipating stage.

systems. As new cells form, others mature and dissipate. A single cell may be only a mile in diameter and have a life span of less than one hour. The entire storm, however, may be as large as 50 miles in diameter and may last six or more hours. Cloud tops can range from 16,000 to 60,000 feet, and the bases vary from 10,000 almost down to the ground. Bases are lowest in very moist, warm air and highest in drier air.

The life cycle of a thunderstorm cell passes through three stages—cumulus, mature and dissipating. In the cumulus stage, there is an updraft throughout the cell. The updraft is strongest at higher altitudes.

When rain first falls from the bottom of the cloud, the mature stage begins. The frictional drag of the precipitation contributes to the formation of a downdraft, which is usually most pronounced in the lower part of the cloud. The updraft continues, however, and is normally stronger than the downdraft.

The mature stage is the period of greatest intensity, with heavy rain and strong winds at ground level. Aircraft encounter the most severe turbulence and gusts during the mature stage. Hail is most often found in this stage.

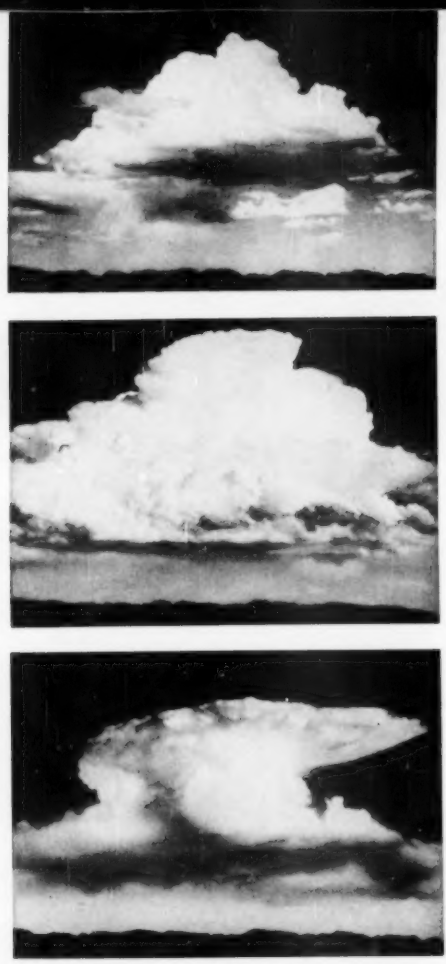
When the updraft ceases and the downdraft spreads over the entire cell, the cell is dissipating. In a little while there is no water available to accelerate the descending air and downdraft disappears.

Cells form and build with deceptive speed. Many pilots have found themselves suddenly enveloped by clouds they thought they were climbing above. Updrafts retain their velocity close to the top of the cell or stormcloud. Turbulence in the upper third of the storm cloud is greater than at lower levels.

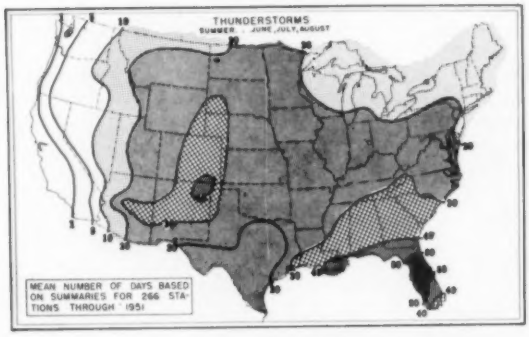
The speed of the rising air current is often as swift as 50 feet per second and in extreme cases has been measured in excess of 80 feet per second. Flying through a typical thunderstorm at 155 knots with constant power setting and attitude, a plane can be forced up 2,000 feet by rising air. In exceptionally severe storms it may be hurled 5,000 feet up. Under the same conditions, a downdraft can force it downward 1,000 to 1,500 feet. When flying through saddles or in too narrow corridors between layers, an abrupt change from updraft to downdraft or vice versa can plunge the pilot into a cloud he had every intention of avoiding.

The greatest danger, however, is not in the sustained updraft or downdraft, but in the extreme gusts created by these opposed drafts when they are located next to each other. These gusts may subject the aircraft to stresses which exceed the maximum design limits of safety.

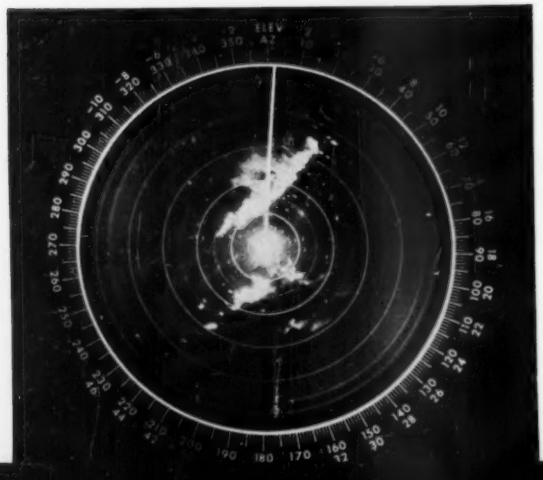
Electrical activity is a distinguishing feature of thunderstorms, as many pilots will confirm who have watched St. Elmo's fire dance around wing tips or form a blue circle fol-



Actual development of single-cell type thunderstorms. Top to bottom: Cumulus, mature and dissipating stages.



Above, average number of days with thunderstorms during summer season. Below, thunderstorm as picked up by Weather Bureau radar.



lowing the propeller arc. But it can be more than a fascinating display. Severe damage may result to the aircraft. The current in a lightning stroke sometimes carries more than 100,000 amperes. At the least, a pilot may lose his radio and electrical systems, or find his radio receiver useless because of static. And there are cases of aircraft being struck by lightning.

The direction and speed of movement of the thunderstorm determine which way the pilot should go in flying around a storm. Unlike large-scale storms, there is no set pattern of circulation around a thunderstorm. Cirrus clouds streaming out from the top of a thunderstorm—which create the familiar "anvil"—indicate the storm's direction of movement. Safe circumnavigation may mean giving it a really wide berth. Severe turbulence may be encountered in clear air several miles from the storm, and hail carried by strong winds may fall from seemingly clear air or from a type of cloud not associated with the storm.

Because of the potential hazards of thunderstorm flying, it is obviously nothing short of folly for pilots of small aircraft to attempt to fly into them. In a number of cases, modern four-engine aircraft have suffered structural damage flying through violent thunderstorms.

The pilot of a small plane, inadvertently trapped in a thunderstorm, can increase his chances of a happy landing by following these rules:

1. Reduce air speed to the aircraft's design rough air speed. This reduces structural stresses.

2. Fly at constant attitude and power settings as much as possible. (Erratic air speed readings result from vertical drafts passing the pitot tube and the clogging effects of rain.) Diving the aircraft to compensate for an updraft may build up excessive air speed. Climbing the plane in a downdraft may cause the air speed to approach the stalling speed.

3. Avoid all unnecessary maneuvering to prevent adding maneuver loads to those already imposed by turbulence.

4. Hold a reasonably constant heading that will take you through the storm in the shortest time.

At low levels, especially during landing and takeoff, gusty winds with frequent, radical changes in direction create hazards. Low level gustiness and turbulence is caused by downdrafts striking the earth and spreading out ahead of the storm. In severe storms, these gusts may reach speeds of 60-70 miles per hour. This horizontal rush of air may happen so suddenly that changes occur at the touchdown area before they are registered on wind-measuring equipment. Similar wind changes may take place during the landing roll and just after takeoff. Once down and parked, the pilot should check tie-down ropes and stakes to be sure they can withstand wind force.

Although the times and areas of thunderstorm development can be predicted rather accurately, no method has been developed for predicting the precise location of individual storms. However, most commercial aircraft carry weather radar to spot them. For general aviation pilots, the Weather Bureau has a hundred weather surveillance radars to detect thunderstorm development and movement. Reports from these radars are summarized hourly and transmitted over the weather teletypewriter circuits. They are available to pilots in flight on FAA radio broadcasts.

With these aids, plus weather reports, a sharp eye, common sense, and strict adherence to the number one rule—stay out of thunderstorms—a pilot will help assure himself of a safe flight.

Letters

FAA

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. Please keep them brief. No anonymous letters will be used, but names will be withheld on request.

• Pilot Certification

Can you provide me with information on use of private and commercial licenses, horsepower ratings, and multi-engine and instrument flying. Are there any requirements for stunt flying, ski and seaplanes, and crop dusting operations?

Hallie E. Shipley
Anamosa, Iowa

Federal Aviation Regulations, *Part 61, contains requirements for all grades of pilot certificates. Horsepower ratings are no longer in effect. To acquire a rating in an aircraft weighing 12,500 pounds or more requires a successful flight test demonstration in that particular make and model.* Civil Air Regulations, *Part 43, Section 43.60, explains private and commercial pilot privileges.*

Acrobatic flight is referred to in Sections 43.48 and 60.18 of the CARs. Seaplane operations require a single or multi-engine seaplane class rating, depending upon the aircraft used, when passengers are carried. Ski operations may be conducted by holders of single or multi-engine land class ratings.

No special regulations govern agricultural or other industrial aircraft operations other than those contained in CAR Part 60 relating to flight below minimum altitudes and over congested areas, and the applicability of Section 43.60 of CAR 43 relating to pilot privileges. The Superintendent of Documents, Washington 25, D. C., has for sale at 55 cents a publication titled Rules of Flight, *which discusses these and other questions in non-technical terms.*

• Aid Private Airports

As the Federal Aid to Airports Plan can legally provide financial assistance only to public airports, I would like to start a program to change the law so that aid could be given to operators of private airfields. Aid would be restricted to airports where the need and a long term financial ability could be proved. It seems to me to be discriminatory to provide aid just to a portion of the airports. In my case, the Red Bank Airport is a vital public necessity. Each week we carry several hundred military and government civilian employees as well as representatives of industry. With this in mind, I believe it a public necessity to keep the airport open.

James Loeb
Red Bank, N. J.

The problem you have outlined is one that is confronting private airport owners all over the country. There is a definite need to work out means and methods for both local and federal governments to give some form of assistance to lessen the financial burden of developing and operating general aviation airports such as yours.

At the present time, the Federal Aviation Agency is at work on possible solutions to this problem. You will agree that the solution is not easy. Although we are concentrating a major effort on determining the most appropriate course of action to follow, we would be less than honest if we were to hold out any hope of reaching an immediate solution.

• Medical Exemption

I received your letter with the great news that I now have my third class medical certificate. I'd like you to know how glad I am to have this wonderful news and that I appreciate everything that has been done in my behalf. The most important thing is knowing that we can be heard. Sometimes we get the feeling that there is no use in trying, so it is great to know that all things are possible.

John H. Lightstone
Coffeyville, Kans.

Mr. Lightstone was denied a third class medical certificate in June, 1959, because of a history of coronary heart disease. Under the Federal Aviation Regulations, it was mandatory to disqualify this pilot for any class medical certificate.

In November, 1962, he petitioned the Administrator for an exemption on the ground that he had fully recovered from a 1948 coronary attack. His case was presented to the Administrator's Medical Advisory Panel for consideration. On recommendation of the panel, the Administrator granted the exemption in March, 1963, and the medical certificate was restored under provisions of the Federal Aviation Act. Individual cases are each examined upon their own merits.

• Preflight Walkaround

In the preflight story (*FAA Aviation News,* April 1963) Item 17 of key to preflight walkaround reads "Door closed and locked and fuel strainer drained."

This item should state that tank sumps as well as the fuel strainer should be checked for water. A gallon or more of water can be retained in the tank sumps that will not be removed by draining the fuel strainer only.

Roy H. Poorman
Canton, Ohio

The story should have said ". . . fuel sump and/or strainer drained," rather than merely referring to the strainer. Effective draining must be done at the lowest point in the fuel system, whether it be at the strainer, sump or elsewhere.

• Lost Plane Incident

The article of the recorded transcript of a pilot brought down out of the overcast by the combined work of FAA's George Baldwin, United Airline Captain Milo Kopp and private pilot Louis Pelletier was very dramatic in its message. No script writer could have done a story with such impact. Truth is still stranger than fiction.

Lyndall Hughes
Chagrin Falls, Ohio

In response to requests from readers, this article has been reprinted as a four-page leaflet. Free copies are available from FAA Aviation News ID-20, Federal Aviation Agency, Washington 25, D. C.

• Dropping Leaflets

I would like to have your permission to drop 5,000 leaflets over the campus of my college. The leaflets will contain students election campaign material. Permission has been granted by the president of the college.

Sam Ellis
Fairmont, W. Va.

FAA does not grant permission to conduct this activity. The rule governing the dropping of objects from aircraft is permissive when it can be accomplished without hazard to persons or property. Responsibility for compliance is placed on the pilot. Section 43.47 of Part 43 of the Civil Air Regulations *states: "No person piloting an aircraft shall permit any object to be dropped from such aircraft in flight which creates a hazard to persons or property."*

This rule does not prohibit either aerial application operations, such as seeding or dusting, or the dropping of newspapers, periodicals, circulars or objects of any kind, provided reasonable precautions are taken to avoid injury or damage to persons or property. In many cases local ordinances do exist regarding the distribution of leaflets, handbills, etc. Consequently, you may wish to make inquiry of the appropriate authority.

In addition, the pilot must comply with CAR 60.17 which requires a minimum altitude of 1,000 feet.

Change of Address Notices

Subscribers to *FAA Aviation News* are requested to send change of address notices directly to the Superintendent of Documents, Washington 25, D.C., and enclose the mailing label from the magazine to facilitate processing their request.

It's there on the next page, as plain as can be, that old anvil top. But Cartoonist Bob Osborn's disdainful pilot didn't heed the warning on page 12.

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Thunderstorms can be quite a thrill

For pilots willing to pay the bill.